

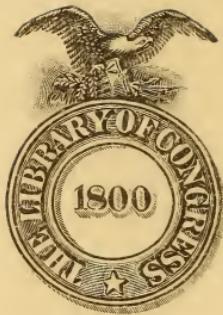
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HUMAN PEARLS



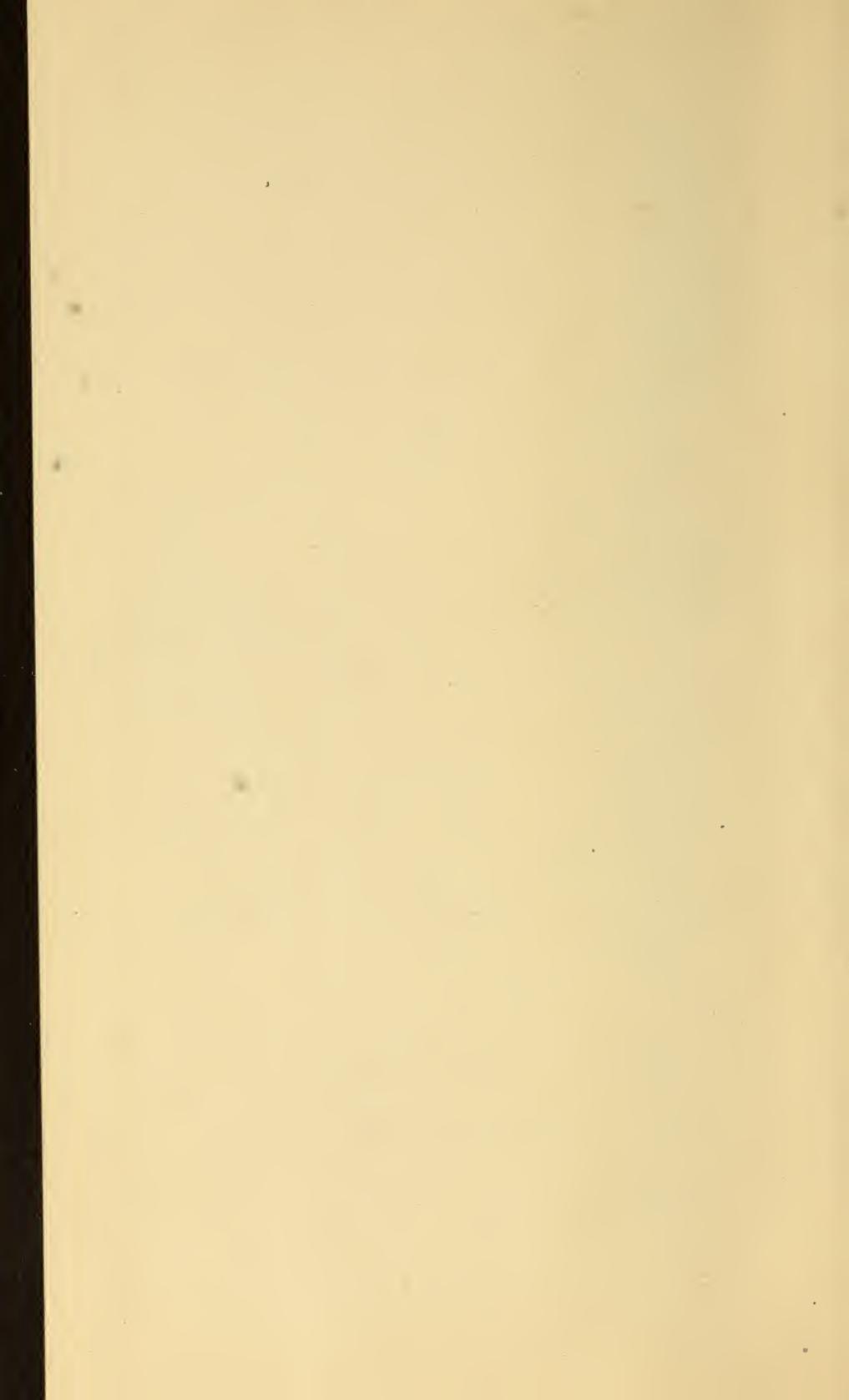


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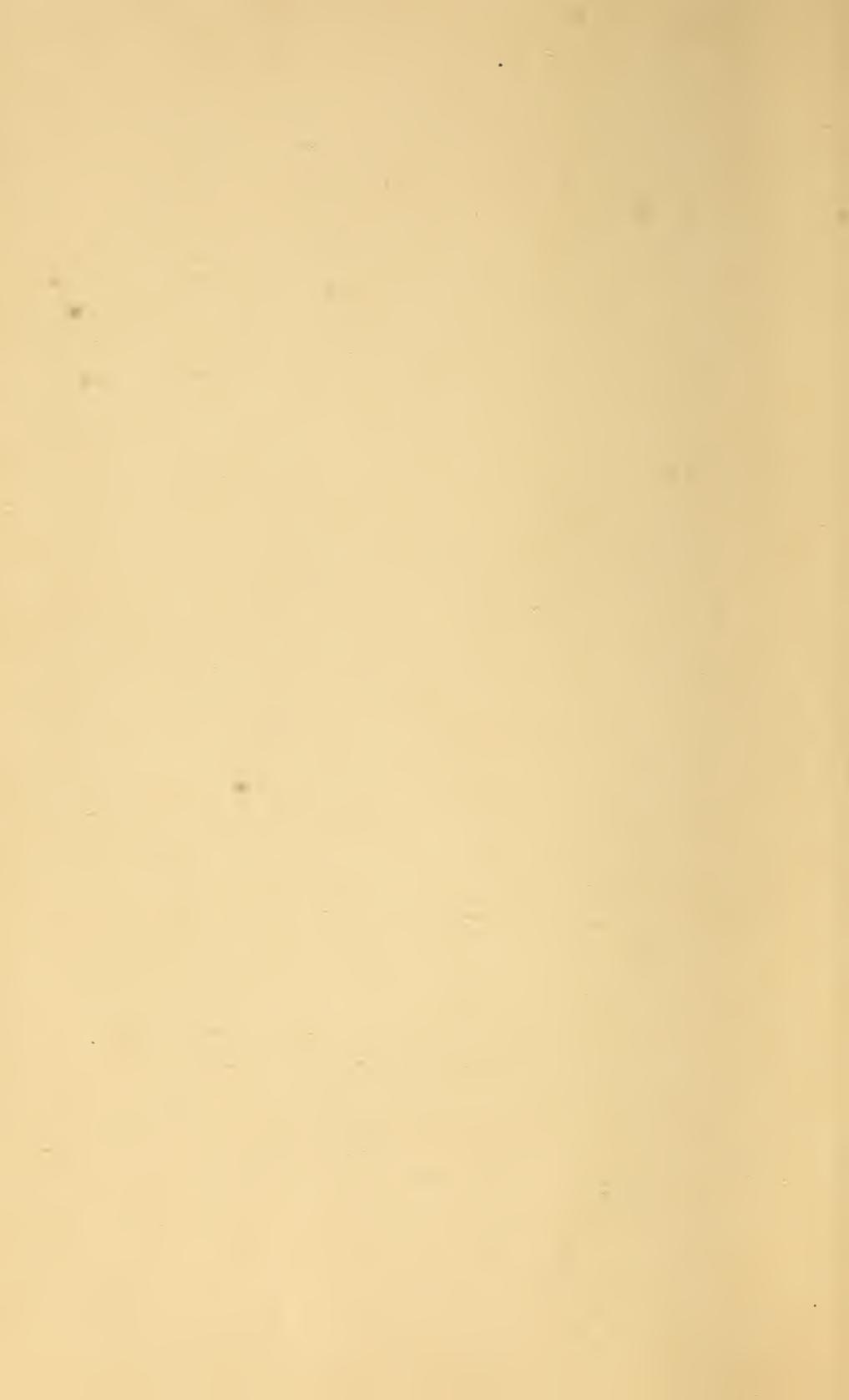
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HUMAN PEARLS



HUMAN PEARLS

BY

FRANCIS EATON BURNETT, D. D. S.

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MEMBER ALUMNI ASSOCIATION NORTHWESTERN
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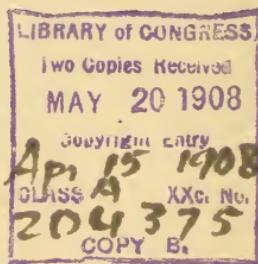
CHICAGO

R. R. DONNELLEY & SONS CO., PRINTERS

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The Lakeside Press
R. R. DONNELLEY & SONS COMPANY
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PREFACE

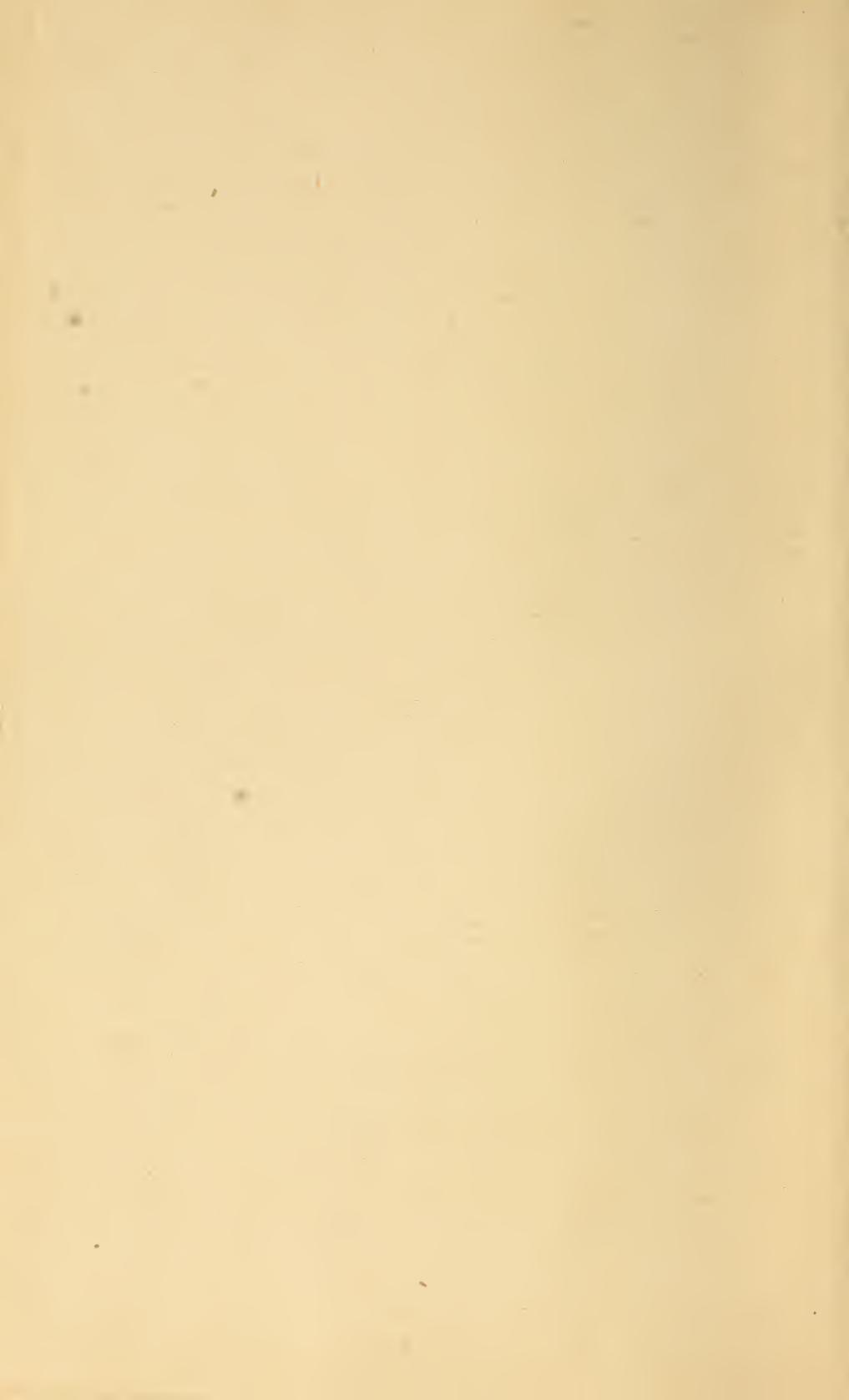
At the age of twenty man may reasonably hope to live forty-two years or 367,920 hours. Can he profitably invest one of these hours to make the remainder more happy and comfortable? This book will answer.

FRANCIS EATON BURNETT, D.D.S.

Chicago, Ill.

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THE MOUTH IN YOUTH

Of the many professions of the present day, that of the Dentist enjoys the happy distinction of being one of the most talked of, indeed, not only has he been discussed, but maligned, and his errand of mercy has been miscalled cruel and painful.

But, however much criticism has been his, he has kept abreast of the requirements of his profession, even has he anticipated them, recognizing the needs of his patients.

Apropos of the new century, when many new thoughts, theories, and inventions will date their beginning, the Dentist comes forward with a definite knowledge of the preventive measures necessary to avert the aches and pains ascribed to the teeth and the dental chair.

The willingness of mothers, in this day, to accept education tending to the care of their children's teeth, encourages first a description of some very common habits or errors of youth

THE MOUTH IN YOUTH

which lead to deformities of the jaw and distorted facial expression.

When a child comes into the world, except as to its teeth and jaws, it is, anatomically, a perfect and complete being, its vital organs are formed and their physiological functions started for life. This, however, is not true of the organs of nutrition in the mouth. The jaw has just begun its growth, which continues until the last wisdom tooth is erupted, except where extraction has taken place, when absorption and growth are going on side by side, unbalancing the relative position of the teeth.

The first organ aiding the nutritive process, described merely because it is an interesting part of the continual change in the mouth, is the sucking-pad, a little biscuit-shaped muscle in the cheek of the babe. Its physiological function of aiding the process of sucking is terminated at weaning time, when it is absorbed. Few realize, in speaking of some chubby-cheeked babe, that they are describing this muscle, so soon to pass away.

So long before the birth of the child is the lower jaw formed, that it is difficult to determine its earliest condition, and singular as it

THE MOUTH IN YOUTH

may appear, this bone, save for one other, is the first one of the body to be developed. At birth, it is but a crude and primitive outline of the jaw that is to be, merely a hollow shell containing some partially formed teeth, the germs or buds of the future teeth; all imbedded in a soft vascular tissue, their nourishing membrane.

The first visual evidence of a tooth is its germ assuming the external form of the crown or enamelled portion. At the time this formation is complete the calcifying process begins, and when sufficiently advanced the tooth is lifted in the jaw, by growth on the root end, and is forced through the surrounding tissue (that is the gums), presenting the eruptive period so joyously watched for by every true mother.

After the teeth have been formed and need support, the nourishing membrane evolves itself into a porous bone, not however until the roots of the teeth have been surrounded by a little covering of soft tissue, cushioning them in the new bone and giving to the teeth the sense of touch.

The roots of the teeth are formed subsequent

THE MOUTH IN YOUTH

to the eruption of the crown, an interesting fact, inasmuch as it suggests that the inflammation of teething would be reflected to the membranes and nerves that are a part of the growing roots. The inflammation, incident to the eruption of the baby teeth, is so closely allied to the ills of babyhood that the physician needs assume this care. At the time the first teeth are erupting, so vascular and so abundant are the soft tissues, that the child is intensely susceptible to nervous impressions; a great percentage of the mortality among children at this period may be properly traced to the irritation of teething. The child becomes peevish, the mouth feverish, the mucous membrane, which is continuous with that of the stomach, is inflamed, nutrition is impaired, and the numerous ailments of childhood are invited. Fever, nausea, diarrhoea, or convulsions may be present. The physician prescribes a sedative to reduce inflammation, lances or sears the gum, and once again baby is cheerful and cooing.

Remembering the early formation of the under jaw, it is not singular that the development of the lower teeth is a little in advance of

THE MOUTH IN YOUTH

the upper, indeed almost invariably are they first in erupting. The first central incisors erupt at from the fifth to the seventh month, expanding the jaw by their presence, and being assisted in this by the lateral incisors, which arrive between the ninth and eleventh months. By this time the four upper and four lower incisors, having produced all possible width, growth begins backward, the first baby molar erupting at about the twelfth to the fourteenth month, and with it comes consequent increase in the length of the jaw. At from the fourteenth to the eighteenth month, the eye tooth, characteristic of strength and defense, takes its position in the corner of the mouth, the watch-dog, as it were, of the developing jaw.

For this reason, perhaps, it has been named the canine tooth. Near the twenty-fourth month the second molars, the last of the baby teeth to take their position, complete the baby mouth.

During the period between the eruption of the teeth, nature is employed in depositing and calcifying the bone cells which are required for development of the teeth and jaw, also in promoting the height of the jaw to accommodate the growing roots.

THE MOUTH IN YOUTH

The period of about four years subsequent to the eruption of the baby teeth is not considered even by the dentist of much moment, but nature is busy absorbing the roots of some of the teeth so recently formed, and is leaving instead the germs and developing permanent teeth.

By consulting the illustrations which show the developing enamel of the permanent teeth at ages one and a half, three and a half, and five years, it will be apparent these enamel organs in their formative stage would be impaired by a very serious illness of the child. Indeed, the relative effect from disease or malnutrition to mark or pit the enamel results the same on the permanent teeth as upon the baby or first teeth.

See subject of malnutrition, p. 66.

At about the sixth year, the permanent teeth begin to erupt, in pairs, the lower centrals first, the two upper almost immediately, and simultaneously with these, the first permanent molars. From the eruption of the first baby tooth to the last wisdom tooth, there is constant growth of the jaw, until the full complement of teeth is in place. Each tooth has its mission

THE MOUTH IN YOUTH

to enlarge the jaw, wedging itself into position, and supporting some fellow member. The front teeth spread the jaw, promoting width, while those in back increase its length. Each successive pair of teeth widens or lengthens the jaw, and when in this direction the baby teeth have contributed to their fullest extent toward the expansion of the jaw, this process of enlargement is repeated by the permanent teeth, beginning again at the same point as did the baby teeth. The erupting permanent teeth are larger than the displaced baby teeth, and increase the size of the jaw laterally and in length by the difference in their width.

When the jaw has been moulded, for breadth and length, the eye tooth comes forward to complete the arch, lending character and strength to the face and mouth. The slowness of this tooth to erupt has caused it to be christened a tusk, and as such it has been extracted, a regrettable error recognized in later life.

It is unwise to extract a tooth "to make room," when that same tooth is doing its share in the proper expansion of the jaw.

Now a word on Extraction: it is a practice

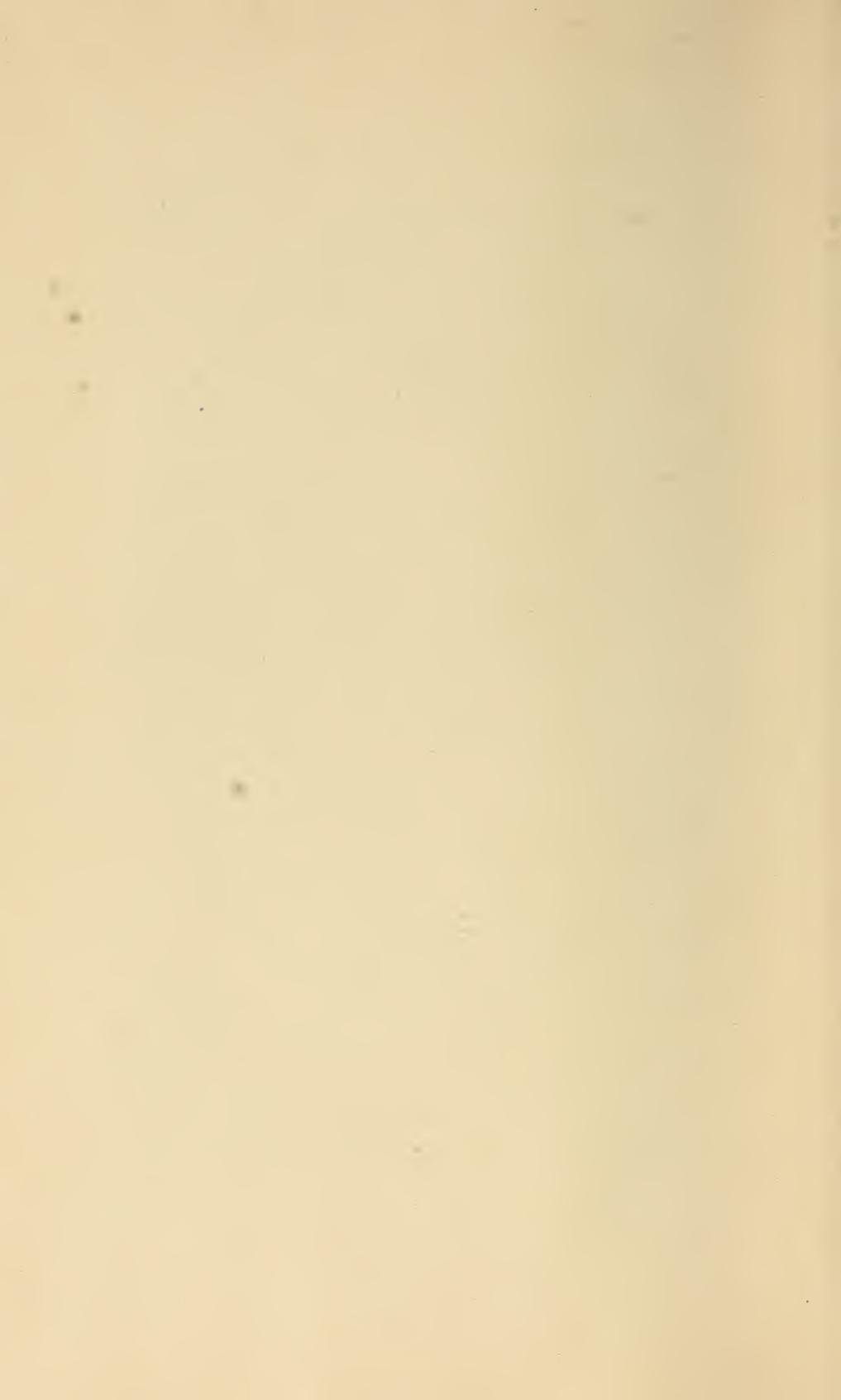
THE MOUTH IN YOUTH

most pernicious, as in the operation, the location of the tooth thus extracted being vacated, it provides an opening into which the tooth next thereto has a tendency to tumble; as a result, the other teeth are deprived of that support necessary to insure their growth in normal position, and that part of the mouth is invited in the direction of an unnatural condition — which is prolific of decay.

The same number of teeth erupt in the upper as in the lower half of the mouth. The tongue resting in the lower part of the mouth, regulates the tendency of the lower teeth to lean inward, while the upper teeth, closing outside thereof, restrict any disposition of the latter to protrude. In the normal condition, the upper teeth are sufficiently restrained from extending outward by the lips and muscles of the face.

So soft and pliable are the tissues of the mouth during the growth of the jaw, and so necessary is it that the pressure be directed to normal growth, that sucking the thumb, breathing through the mouth, the too early or too late extraction of the baby teeth, the very untimely extraction of a permanent tooth (es-





THE MOUTH IN YOUTH

pecially the sixth year molars), serves only to defeat nature in growing a perfectly shaped jaw. See illustration page 26.

If the mothers would manifest the same interest in the permanent teeth that they do in the baby's first teeth, what a blessing would accrue to humanity! No parent can ever atone for the injury done a child in neglecting the first permanent molars, which erupt at about the sixth year. Their location, just back of the baby molars, causes them to be mistaken by the parent for teeth soon to be shed. Decay ravages unheeded, until the parent, brought to a sudden realization of a serious condition, appeals to the Dentist. Too often the tooth is so decayed that extraction is unavoidable, and the first molar gone, the second usurping the half absorbed space, occupying it but rudely and abnormally, invites early decay, while the whole alignment, the normal horizontal plane of the teeth is lost, the jaw is shortened and crooked, and the most prominent of the grinders gone. This error found in the mouth is so apparent it seems to have been appreciated by the earliest of writers. The following was written thirty-seven years ago:

THE MOUTH IN YOUTH

"It must be remembered that eruption of the second teeth begins while the first set is yet in the mouth, and because of its importance we repeat that between the fifth and sixth years the first permanent molars, four in number,—one on each side of the upper and lower jaws,—make their appearance; these teeth are supposed by the parents to belong to the first set; and so, if, as very frequently occurs, they decay shortly after their eruption, no attention is paid to them, because it is thought that they will soon have to make room for their successors, and before the error is discovered the mischief is irreparable." While the change so disastrous to the grinding surfaces of the teeth is most marked by the extraction of the first permanent molar, still a similar condition will be caused by the removal of any tooth, if done before the jaw has attained full growth.

It is to be borne in mind that, after the first appearance of a tooth through the gum, it requires four years to complete the growth upon the root. In the first year the root portion on the inside is hollowed out or funnel-shaped, while the deposits of bone cells each month

THE MOUTH IN YOUTH

gradually constrict this flaring opening until the root has a conical point. The watchful parent will see that the youth's mouth is kept in a normal condition, that the roots may complete their growth and the teeth be enabled to live their life as useful members.

But in passing from these serious stages of the youth's mouth, it is gratifying to know that the whole responsibility of the parent comes at such regular intervals, and the protecting measures are so minor if taken in time, — that it must be observed the care is really nothing.

The parent may thank nature that in very early youth they are responsible only for the decay that takes place in the pits and grooves of the teeth, and that a greater ravage of decay, which takes place at the gum line, comes at a time when the child will have learned the virtue of the tooth-brush to prevent this invasion.

Particular attention is called to malformations of the mouth and jaw and the numerous causes leading thereto. We have seen that constant pressure is the prevailing condition in the development of the jaw, and any limitation

THE MOUTH IN YOUTH

thereof disturbs the harmony of growth in the mouth.

Neglect to use the nasal passages for breathing causes them to become constricted, and the roof of the mouth, assuming this new role, enlarges, terminating in a deformity as a result of which the face is very unlike what it would have been had the proper remedy been applied in time. Many growths that obstruct the nasal passages and the rear vault of the mouth are but inflammatory enlargements, as the glandular enlargement of the tonsils, or the thickening of the mucous membrane of the nose into a gelatinous polypus. The removal of these formations by the physician is but a simple operation, whereby the patient avoids a lifelong care and a constricted pinched appearance about the nose. Any difficulty encountered in breathing through the nose should be immediately investigated by the physician or specialist. The position in which the tongue is forced or held to aid breathing through the mouth will, in time, cause the upper front teeth to protrude.

The sucking of the thumb will change the relative position of the teeth so that this

THE MOUTH IN YOUTH

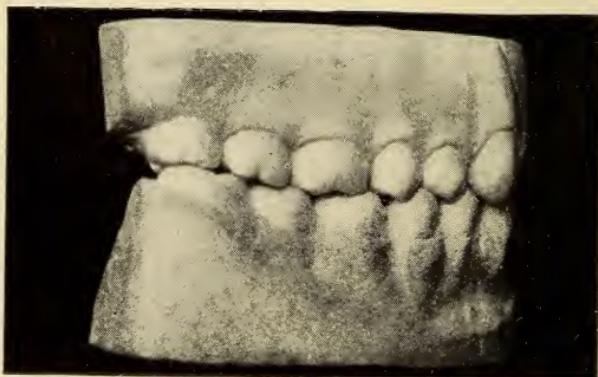
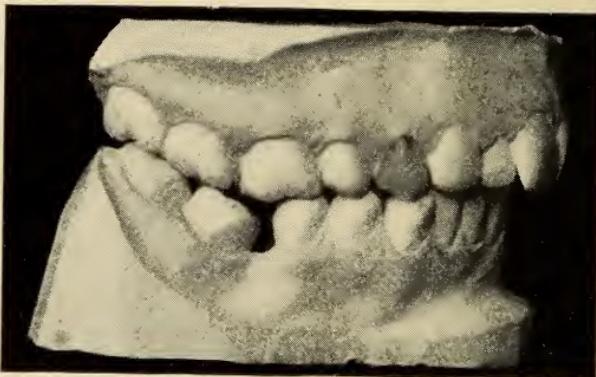
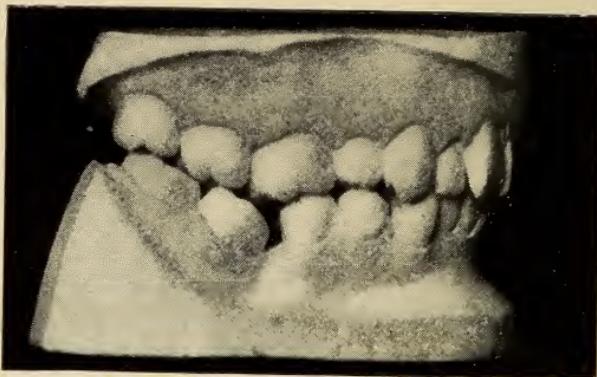
seemingly simple habit results in a deformed mouth for life. One single tooth displaced may cause the entire side of the face to move from the normal position, and all teeth to erupt later will follow the fault thus established. But this is not *all* the evil. The normal occlusion or closing of the teeth is lost, and aggravated by their ill-use, the result of their unnatural position, they are going to their doom, to be toppled or crowded off the ridge of the jaw, or to be quickly decayed by conditions which come of their non-use.

Probably the greatest number of facial deformities find their origin with the teeth; rapid decay, delayed eruption, extraction of, or accidents to the teeth, are some of the many causes to which we may trace most of the deformed faces we see to-day. Congenital causes and others requiring too detailed a description might be given; suffice it to say, that nearly all come within the possibility of correction. The protruding lower jaw and the peaked upper are only magnified conditions of some very slight fault of early years; some favored tendency that prevented the true development of the teeth, tongue, lips, or jaw.

THE MOUTH IN YOUTH

Nature is kind and needs only be recognized in error when it accepts willingly the slightest help. A beautiful face may grow displeasing or to entirely lose all family resemblance by the neglect of teeth in childhood.

NOTE.—Those interested in the prenatal conditions which affect the teeth, see p. 66.



THE MOUTH IN YOUTH

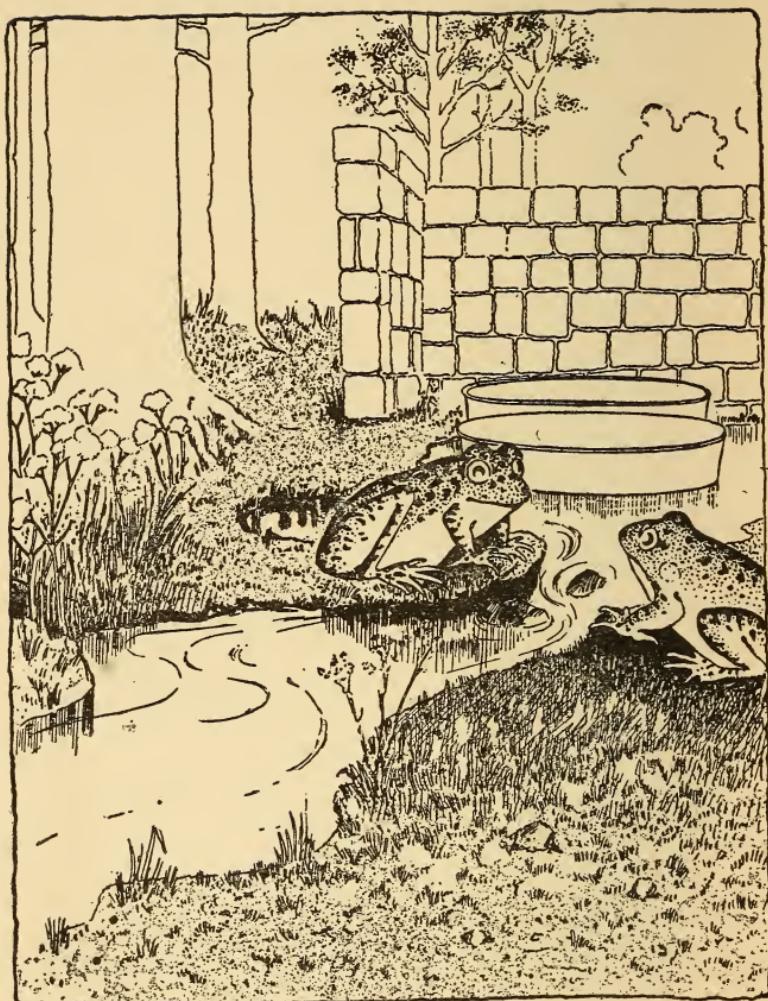
The casts on the accompanying page illustrate the same mouth in three aspects.

The first shows the untimely loss of the lower first permanent molar, with the second molar tipping forward rudely occupying the space, while the wisdom tooth leans to the fault thus established.

In the second illustration instead of a normal horizontal plane (see third picture) the jaw is crooked, creating an incline down which the upper teeth must slide (a simple law of physics) pushing the front teeth forward until they protrude from the mouth.

Realizing that the upper front teeth bid fair to move forward at least the width of one tooth, the upper first bicuspid was extracted, thus relieving the pressure from the rear; with the result that the pressure of the lip on this young mouth retracted the teeth some, while the further growth and development brought about the condition as in first illustration.

The second picture exhibits the mouth as it would have been had not this first bicuspid been extracted, while the last one illustrates what nature intended the mouth to be, had the teeth and jaw come to their normal maturity.



FABLE OF THE TWO LITTLE FROGGIES

In the large jar, placed in the cool water of the spring, the milk and cream were kept. One day two little froggies came hopping along and carelessly leaped into a jar of cream.

Now, these little froggies did not know what they had gotten into, and one was brave while the other was frightened. The frightened and lazy one said, "We shall die in here," but the other said, cheerfully, "Let us try to get out, let us see what we can do by trying." But the lazy froggie would not try, so he quit paddling, sank to the bottom, and died.

Now, the willing little froggie began paddling to find his way out, and he swam around and around the jar of cream. As he paddled harder and harder, he made the cream foam by his little paddles moving so fast. Bye and bye, when he was very tired, he came upon a little lump floating about him, and he rested one

FABLE OF TWO LITTLE FROGGIES

of his little paddles upon it; soon he found another and he rested two paddles, then he started again trying harder than before—when, lo, he found many little lumps, and swimming about he made them all together in one big cake, which he climed upon to rest. When he was rested he gave one big leap out upon the grass.

Can you guess what the little froggie did by trying so hard?—he had stirred a cake of butter out of the cream by his lively efforts, swimming and kicking his little paddles so fast. Can we not do great things by trying? Remember the little froggie, and try hard. Is it not better to try and care for your teeth so they will not decay and the nerves die?

Remember, little girl or boy who cries with the toothache, would it not be better to keep your teeth clean so they will not ache?

STRUCTURE AND PHENOMENA OF THE MOUTH

The teeth of one mouth contain a yard of nerves and have an enamel surface of from twenty to thirty square inches!

While it is interesting to note the successive changes in the mouth of the youth, still that of the adult is not without interest. The permanent teeth, unlike any other organs, are not born with us, but have come into our lives after all other parts are formed.

Like the mighty oaks, which from tiny acorns grow, the permanent teeth have their beginning in little buds, put off from the baby teeth, and seem to say, "I came to life in your day, that I may participate in your habits." But, while they are so strong, they have their weakness, which we have but to protect to maintain their integrity through life.

Indeed, anatomical weak spots are not uncommon in nature, and to know them is to

STRUCTURE OF THE MOUTH

protect them. On the lips the junction line of the mucous membrane and the skin, is an anatomical weak spot, in that the veins, arteries, and nerves do not cross. An illustration would be the crest of the Rocky Mountain divide, where the waters run toward the Pacific and the Mississippi. Another weak spot is the tonsils, the lower part of which receives its nourishment from the region of the thorax and chest, while the top part is nourished by vessels from the cranium; thus an imaginary line in the center is a negative zone, and the rapid advancement of a malady may occur.

It is the purpose to recognize quickly the first danger signal, and act before more tissue is included in this negative zone. The signal is nature's method of inviting attention to an impending danger.

Recognizing a virtue as coming from such signals, man has adopted these structural weak spots; as in electric wiring, where an overheated wire would ignite a building, but for which, a weak spot in a metal fuse box burns out and cuts off the current.

From the weak spot in a tooth comes nature's alarm signal, and singular, too, it is from

STRUCTURE OF THE MOUTH

behind the strongest and hardest tissue known in the animal kingdom — the enamel.

So hard is this enamel it will quickly dull steel instruments; it is harder than the ivory of an elephant's tusk, or even the tooth of a rhinoceros. The enamel is thickest on the grinding surface, and thinnest at the gum line, and covers all the crown of the tooth and just a little portion under the gums, where the root begins. It is illustrated by putting a thimble over the finger.

The junction line of the finger and the thimble illustrates the anatomical weak spot in the tooth, and is the very place whence the signal of distress comes. The line of cement which attaches this enamel to the dentine,—if cement substance it may be called,—when magnified 2,000 times, does not exhibit any structure; yet by some mysterious force it is capable of giving signals, even prolonged ones of severe pain.

Thus, the first thought suggested is the penetration of a substance under the enamel that will dissolve this contact point, also that signals warn you it is to take place. This very interesting cement line is like the wireless telegraph,

STRUCTURE OF THE MOUTH

in that all these little impulses of pain are communicated through the bone of the tooth to the pulp or nerve. Very interesting when understood, the shocks do not travel over wires or nerves to the center of the tooth, where lies the pulp or nerve, but go directly through the bone. All of the pain experienced while having a cavity prepared for a filling comes from this little sensitive line under the enamel.

If lightning should strike a wireless telegraph station, its sensitive instruments would be shocked — burned out — and if these danger signals from under the enamel be too continued, or too severe, the nerve or pulp which is some distance away is gradually congested by the irritation, which retards the venous circulation.

The dentine, which is very like bone, represents the shape of the tooth, including root, except for the portion covered by the enamel. Though it is the shape of the tooth, it is not solid, but is hollowed out in the center to receive the pulp, commonly called the nerve, the much dreaded nerve.

The pulp is a miniature in form of the shape of a tooth; that portion in the crown

STRUCTURE OF THE MOUTH

surface having a bulbous head, with little horns, while the portion in the root gradually tapers till it is a mere thread where it leaves the tooth. Through this very small opening at the apex of the root, veins, arteries, and nerves come and go, and because this opening is so small a slight congestion will entirely close it.

The second thought suggested is that decay, when once established under the enamel, will travel in the line of least resistance, which would be through the dentine, and the nerve or pulp would soon be reached. The removal of all of the dentine softened by decay frequently uncovers some portion of the pulp; but this, however, *is* a fortunate circumstance, as the pulp would surely have died had the decay remained there and the poison have been absorbed by the pulp.

The pulp occupies the center of the tooth, as does the wick in a candle, except that the wick runs entirely through the candle, and the nerve runs out only through the root end. Since the pulp is composed of vascular tissue, it is implied that in a tooth an artery terminates and a vein begins, accompanied by a bundle of

STRUCTURE OF THE MOUTH

nerves to promote action. Since then a tooth receives arterial blood and discharges venous blood, if the latter stagnates while the former is still crowding in, a clot will be formed, and the whole pulp dies en masse by strangulation from its own blood supply.

This is exactly what does occur from the irritation of the prolonged danger signals or from the penetration of decay through the dentine.

If two electric wires lying near one another should get a drop of water on them, the current might transfer from one to the other; likewise the inflammation, extending or backing up on a nerve fibre, may be reflected to the nerves of the eye or ear, while the pains in the side of the face are frequently mistaken for those of neuralgia.

Whether the pulp dies by shock or by pre-meditation it should be removed, and the canal thus vacated filled; by so doing this space would not be occupied by gases, or the canal be a means of communicating infection to the jaw-bone.

The jaw must not be considered as a solid bone, for in fact it is as porous as a sponge,

STRUCTURE OF THE MOUTH

except the outer surface, which is vitreous and hard. Any tooth infection which is permitted to reach the porous parts, which could be through an open pulp canal, will certainly and easily dissolve away the porous bone and leave the tooth unsupported.

This is what is termed an ulcerated tooth.

Because of the recesses in and a part of the many bones of the middle third of the face to which infection may communicate, the percentage of deaths from this cause is greater with neglect of the upper than the lower teeth.

Running through the porous part of the jaw in a canal for that purpose are the veins, arteries, and nerves, which send off little branches to the various teeth. When the pulp in a tooth is killed, these branches shrivel up till they reach the main trunk.

The gum, the last tissue of the mouth to be described, is the least appreciated or understood, notwithstanding no other tissue has a more important mission to perform. In health the gum may be called the protecting agent of the mouth, it finds its way into the tooth socket to protect the root, it fills the spaces between the teeth to keep food debris

STRUCTURE OF THE MOUTH

out, and, most important of all, it is grown fast to the tooth to cover and protect that anatomical weak spot where the enamel ceases and the root begins. After having become attached to the tooth at the gum line, this membrane, which is called the peridental membrane, spreads itself over the whole root, so that the tooth has a capsule of tissue cushioning and holding it in the jaw-bone.

This membrane is so strong, and is grown so fast to the tooth and the jaw alike, it requires much effort to extract a tooth from it. Realizing that a membrane does exist between the root and jaw, it is evident how important is its mission to keep the fine food debris from seeping into this forbidden territory. But not satisfied, the gum encircles the teeth, filling every recess — that the decaying food debris will not loiter, but will be pushed out upon the enamel, where there is a smooth surface — and which nature has provided will care for itself.

If, as stated, the root is covered with a capsule of tissue, it is obvious that the nerves, arteries, and veins in leaving the tooth must have penetrated or passed through it, and since in the

STRUCTURE OF THE MOUTH

presence of dead matter the hole would not heal or close up, and because putrefaction and ulceration follow in the wake of dead pulps, it would be easy to communicate through this newly-made hole to the porous portion of the jaw-bone, infect it, or at least seriously irritate the peridental membrane. Indeed, the early removal of a dead nerve permits this membrane to grow over and seal up the end of the root.

A tooth not treated after the death of its pulp, or permitted to ulcerate, will naturally be a weak tooth, and as a chain breaks at its weakest link, this uncared for tooth reflects the physical condition of the patient and a cold often settles about it. This is particularly evidenced in the bathing season; when shivering in the cold water, the tissues become congested about an affected tooth.

It is finally apparent the teeth have two sets of nerves: the pulp of the tooth, being affected by decay, and the nerves of the peridental membrane, which are affected by the sting and poison absorbed from dead matter permitted to accumulate at the gum line and at the apex of the root.

DECAY OF THE TEETH AND DISEASE OF THE GUMS

It is said the great Edison could revolutionize the motive power of the world if he could find a battery box whose walls would withstand the influence of the chemicals contained therein. Realizing the power of these chemicals to dissolve the retaining walls, one might wonder how the stomach could withstand the disintegration of the food stuff by the chemical process; indeed, the constant movement of the stomach walls, and the presence of quantities of water to dilute and wash the parts, protect this organ. Because man has permitted his mouth to be included in this chemical laboratory, this cavity must participate in the wasting of its walls.

This, however, is not such a serious condition, for if the mouth be clean and healthy, the saliva will dilute and keep moving the food particles, which, instead of fermenting in the mouth, will be floated in the current of saliva to the stomach.

DECAY OF THE TEETH

In the olden time the grinding and crunching of the coarser grains and hard breadstuffs brought about a cleansing effect to the teeth, while to-day a great portion of the food requires no chewing. Of the food stuff of to-day, much is so seasoned and surcharged with a chemical nature that the immediate cleansing of the mouth after eating is necessary to avoid fermentation in and about the teeth and gums.

With no disposition to challenge technical criticism, we venture the suggestion that the retrogressive condition of the mouth is associated with intellectual growth. In the higher education of the man of to-day we see exemplified the growth of the mental man, whereas the life of our ancestors represents the physical growth. As the mental area is nourished, correspondingly is the physical neglected.

The jaw is but the connecting link between the mental and physical man, and in the measure and nature of the demand made upon it so will that jaw evolve.

Indeed, we have to-day, in the mouth, the living proof of this evolution, in that the jaw is shortening and the wisdom teeth are frequently missing, and when present are often

DECAY OF THE TEETH

of but very irregular type and crowded out of place.

In order to secure the true form of the jaws they must be given their proper use; the crushing of hard foods is the true exercise and is also essential in maintaining the physiological condition of the gum tissue and muscles of mastication.

The crunching of pop corn, toast, and dry bread is beneficial to the teeth and gums, while the dry nature of the food requires saliva to moisten the bolus before the act of swallowing is possible.

Compare the plain and coarse diet of the aborigines with the cakes, creams, puddings, and prepared foods of to-day requiring no mastication; need we ask if nature will maintain in the jaw and teeth of the present age the powerful grinders they were formerly?

Since the thought of the smell and the taste of appetizing foods has such an influence over the sub-conscious brain as to, by reflex nerve action, send a limited supply of saliva to the mouth, is it not proper to believe that the normal and necessary flow will be deposited by the actual presence and active mastication of food?

DECAY OF THE TEETH

From one to three pints of saliva per day are necessary for digestion. How will the glands be excited to flow without nerve impulses originating in the proper use of the teeth?

From early youth we have to do with decay of the teeth and disease of the gums,— both easily prevented, as we shall show, as they are but a condition of uncleanliness.

Nature forms the teeth with curves, planes, and crests, and locates them in such position relative to each other that the passage of food over the various surfaces, together with the movement of the tongue, lips, and cheeks, produces a natural condition of cleanliness. This condition is modified in proportion to abuses, habits, faults from youth, and the influence of modern diet.

It may not be generally known that decay is ever repeating itself in exact and certain parts of each tooth; it does not happen miscellaneous over the tooth's surface. The enamel is so hard that decay cannot penetrate it in a day or a week. With this knowledge of the places liable to decay and the time necessary to penetrate the armor (enamel) of the tooth, the dentist of the future will have as his mission to

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prevent the dissolution of the tooth substance by the decay germ. His object will be to check the colonization of the decay germs at the favorable places they seek to locate; these are the deep fissures or pits in the teeth and the spaces between the teeth and at the gum margin. In the pits and fissures the enamel is so thin and so given to faults, it is the purpose to carve away this weak structure and place instead a non-destructible filling material. In a canyon or ravine the soft silt-like accumulations seek out the deep crevices, and in the little pits of the teeth, decaying food debris will do the same, but providing an impenetrable substance to occupy the bottom of the pits and fissures prevents the decay from invading the tooth structure.

Thus there is a happy thought in preventing the loss of a tooth by caring for these cavities when small.

A far more disastrous type of decay is found at the gum line, as has been hinted, as that which creeps under the enamel to occupy the anatomical weak spot.

Normally the space between the teeth is filled with gum tissue, supported by a little

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spine of bone arising from the jaw. From prodding with a toothpick or from the sting and poison of debris, this little spine recedes, the gum follows, leaves the enamel where thinnest also the root exposed, and the space between the teeth open for the lodgment of foreign matter. Of all decay the most destructive is found at the gum margin, particularly because it is, as a rule, permitted to ravage unnoticed. Dividing a tooth into imaginary quarters at the gum line, there will be four places whence decay may begin, but since this is but a fancied line, it is obvious that decay from these places would soon connect and advance in a circle around the tooth.

It is good and kind in nature to have the gums lap upon and protect this weak line, indeed the younger the person the greater the lap, so that no decay appears until some years after early youth, when it may be said deliberate neglect has permitted this protecting membrane to become so stung, flabby, and bleeding it cannot help as nature intended.

Thus the second and last type of decay is incident to the departing gums.

An illustration in figures portrays the

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worst condition of decay. Quoting from an author upon a method of filling the teeth, the following is significant in that it suggests the number of cavities possible in one mouth:

“In a set of thirty-two teeth this system may be conservatively used in eighty-one distinct cavities, not counting approximal cavities.” — and now adding sixty for the approximal cavities, we have one hundred and forty-one places from which decay begins. Indeed, the different locations are about two hundred all told, whence decay may start in a full complement of teeth.

Where extreme neglect exists, decay may be ravaging from nearly all of the two hundred points of vantage. The meeting of decay started from different points causes a sudden break-down of the tooth, which is such a surprise to the individual. Much then of this decay exists by man’s invitation, as for instance at the gum line, since this when healthy will protect the teeth where the enamel is the weakest.

But however desirable it might be to prevent a large proportion of the cavities likely to be in the mouth, it is difficult to state whether

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the preventive measures which might be adopted would not bring a greater good to the gum tissue than to these threatened teeth.

As has been stated, the gum tissue is grown fast to the teeth, and the first particle of foreign matter that seeks a place under the free margin of the gum, and remains sufficiently long to destroy the natural contact, is the forerunner of a disease to which reference will be made later. Once this contact point is broken, the fine food debris finds its way between the root and the jaw-bone, while the capsule of gum tissue — normally there to protect this space — now moves back to get away from the ever present poison.

In referring to the space between the teeth being occupied with gum tissue, only a hint was given of a greater truth, in that the little spine of bone arising from the jaw to support the gum, retreats also from the infiltrated poison; thus little pockets or depressions in the gums are formed, which are increased by food stuff crowding in, and now pain follows from an attempted swelling down in the socket where there is no room for it to take place.

In health this membrane around the root

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gives the tooth the sense of touch, but in disease this sense of touch is changed to a sense of pain.

If the gum becomes inflamed and swelling takes place, the tooth or teeth are raised in their sockets until higher than the others, when they receive all the concussion upon closing the jaws.

Cure when in its first stage is very possible, and is included in that same cleansing process that prevents decay, but without the help of the dentist, the flabby, loosened, bleeding condition of the gum goes on. The continued pain is but evidence of the sting and inflammation resulting from the chemical action of acids and alkaloids, the deposits from savory dishes, palatable drinks, medicines, and what not. The deposits on the teeth are as equally dangerous to the gums as is the decay to the teeth, and their removal insures the return of the plump, hardy condition of the former.

Just here a passing tribute may be paid the saliva. The first virtue of this limpid liquid stuff (three pints of which are deposited per day) is to dilute, dissolve, and to keep moving the food debris, but it cannot loosen the glue-

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like substance that becomes fastened to and about the teeth.

Almost the entire care of the mouth, if begun early enough and carefully observed, will come under the head of *cleaning*.

Those who have had that terrible trouble of the gums known as pyorrhea, or Riggs disease, would gladly have had this protection and prevention. Pyorrhea is a disease resulting from the deposit of a lime-like substance from the saliva upon the teeth, underneath the gum. The inflamed gums recede from the ever present poison, which the lime absorbs, while the deposits become deeper and larger, until the tooth may be lifted from the socket. The early stages are characterized by bleeding gums and looseness of the teeth, which may become loose enough to drop out unaided. Indeed, the most beautiful teeth ever admired may be thus afflicted, and may come out, as patients frequently describe,—“without apparent cause.”

But with the care of the mouth there is a reward usually in later life. If earlier conditions were made favorable, the mouth enters a tranquil period when immunity from decay

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seems to exist. Why, it is hard to state,—though decay may have run out,—but while it *does* exist, it communicates from tooth to tooth and removing it from these places may remove it from the mouth.

Indeed, much decay is much trouble; intelligent care is no trouble.

If the individual cannot devote much time to the care of the teeth, let him at least occupy ten minutes once a week in a general cleansing of the mouth.

Wash and scrub, see-saw the silk ligature between the teeth, scrape the tongue, rinse, wash, and scrub again, and the result will be the removal from the spaces between and about the teeth, and partially under the gums, of meat fibers and food debris, all decaying and lending their influence to the mouth.

In doing this the individual will have but taken ten minutes of the time which would have been given the dentist for the cavity just averted. This is recommended as an occasional cleansing, like a full bath which is as healthful to the mouth as to the skin.

But as the face and hands need more frequent washing, let the teeth be rinsed or

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brushed a minute. If, as the result of the thorough weekly cleansing, the spaces are not lodged full of debris, the mouth may be rinsed with an oxygen-bearing solution, which now being able to get into all the spaces, the lighter and smaller debris will be boiled out or oxidized (burned up). Any of the favorite methods of using powders, pastes, and liquid cleansers are recommended, and may occasionally be supplanted by strong salt water or soda in water.

The whole theme is to cleanse the mouth, permitting no lurking deposits to become more than a day old, for if allowed to remain longer they will become putrid.

If, as between a silk thread and the tooth-brush, one must be dispensed with, let it be the brush. In the hands of most people, it has served admirably to brush food debris into, instead of out of, the space between the teeth. The brushing should end with a perpendicular stroke to cleanse between the teeth as well as the brush will do it. Silk floss used with a see-saw motion between the teeth at intervals of twice a week (the oftener the better), will serve to keep these parts free of foreign matter,

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in which the decay germ finds its habitat. Just before retiring, the mouth should be thoroughly cleansed, as at night the most morbid condition exists. During protracted illness, the trained nurse cleansing the mouth frequently, to prevent a fetid and uncomfortable condition, does incalculable good for the teeth and gums.

Most diseases have their entrance to the body through the mouth,— indeed, it is an established fact, that if before surgical operations requiring prolonged anesthesia the mouth be sterilized and cleaned, fewer cases of surgical fever and pneumonia develop as an aftermath to the operation.

It simply establishes the truth of germ life in the mouth (of which 150 kinds are known to exist), and if in decayed teeth and in the general soil of the mouth these disease germs live in countless millions, it is assured they are ready to invade the whole system at any time the physical resistance is below normal.

Of this germ life it is said 10,000 can get within the single spot made by the touch of a pencil point. The few germs that are primarily in a clean mouth are harmless to produce

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untoward results if robbed of their power to multiply. It is the numerical increase and the poisons absorbed that precipitates the disease from the bacteria.

How much better, then, would it be were the mouth sterile and clean, instead of a hotbed or incubator of infection and decay.

The mouth is the beginning of the alimentary canal, thirty feet in length. Saliva that has bathed and lurked about a diseased mouth is soon to moisten a bolus of food, for its long journey of — good(?) Is it not suggestive?

However industriously one may cleanse the mouth there will be required, periodically, the careful technique of the Dentist. Those who would preserve their teeth through life should give twelve pleasantly spent hours each year to him.

Since the theme is prevention, monthly appointments should be made, though it is probable that cleansing once in two months would suffice to prevent decay. To avert decay and inflammation in the mouth very painless work would be performed which would require fewer hours than are necessary to eradicate a disease established. By gentle manipulation, with keen

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and very special instruments for this particular work, the teeth are cleansed and deposits removed from under the gums, while pleasantly disguised medicines invigorate and refresh the gums and mouth. This, with the personal care of the teeth as described, will exempt one from the painful operations of to-day and the dreaded thoughts of the dental chair.

To one who is skeptical and wishes positive evidence to encourage a belief in preventive measures, five *facts* are submitted:

First. The glazed surface of the enamel, when clean, is not conducive to the lodgment of foreign matter.

Second. Maintaining a healthy condition of the gum tissue protects the teeth where decay is most destructive.

Third. The gum tissue will not lie next to foreign matter; it recedes therefrom, leaving the root unprotected.

Fourth. Where the tongue or cheeks rub clean a part of the teeth no decay occurs, therefore to provide equal protection for other locations, artificial means must be employed.

Fifth. By taking ordinary precaution, you are avoiding the graver conditions which come to those who continuously neglect the mouth.

Those who are disappointed in their efforts to care for the mouth are encouraged to try again.

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The mouth should be sterile and clean — if need be, supplant some constantly inflamed tooth with a modern appliance. Have all the diseased roots extracted, "catch up," as it were, with a healthy condition, then maintain it by thorough cleansing.

If a tooth be extracted, the opposing one on the opposite jaw, having no antagonist, immediately begins to emerge from its socket, because of the lack of a tooth to hit against. Also, the extraction of a tooth relieves the pressure existing between the teeth, and one gone the rest will lean and tilt in a new position, likely to result in spaces between the teeth that will be found prolific as food accumulators.

This takes one forcibly back to the loss of the first permanent molar.

But there *is* a tooth that may be extracted. The excessive pain accompanying the eruption of the wisdom tooth is caused by the effort of this tooth to crowd itself into too small a space. The vestibule of the mouth (that portion between the teeth and the cheeks) is frequently so small in the vicinity of these last teeth, that the removal of the wisdom tooth often serves to make the mouth more spacious and self-

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cleansing in these parts, and saves the next teeth from the contaminating influence of a decaying wisdom tooth.

The intent of this book is not to alarm; indeed, it can educate, do much good, prevent hours of agony, keep normal and beautiful many faces, and give a greater degree of health if one will but follow it.

So beautiful and wonderful are the vital phenomena of life, and so dependent is life on each of these forces, that there can be no question of the wisdom of maintaining the integrity of the most important one — nutrition.

Health is the maintenance of the whole physiological process of man.

In conclusion, these are the pictures. At fifty, or less, shall one be toothless, with cheeks emaciated and sunken, a sallow complexion, jaws absorbed to a mere vestige; or shall one possess a full set of well-worn teeth, with face ruddy and bright, the whole being full of the snap and vigor that comes of the consciousness that one is in control of all his forces?

Shall it be prevention, or shall one wait until nerves die, until abscesses and kindred troubles drive him to the Dentist?

TEMPERAMENT AS POR- TRAYED BY THE TEETH

Temperament is that state of body and mind as influenced by constitutional conditions. It then is constitutional, depending upon such influences as arise from predominating physical conditions. These physical conditions in man are divided in four elementary parts, viz.:

Sanguineous.	Nervous.	Bilious.	Lymphatic.
Circulation.	Mental.	Motive.	Nutrition.
Heart and Lungs.	Brain and Nerves.	Muscular.	Stomach and Liver.

The four functional parts of man's physical being represent his life's activity, and as his internal fires burn constantly, and some one part finds itself more highly ordained, its activity influences the whole physical economy. These influences perforce acting upon the stature, mind, action, and influencing the character, do immediately classify man as belonging to one of the temperaments:

Sanguineous.	Nervous.	Bilious.	Lymphatic.
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The ancients were the first to give considera-

TEMPERAMENT AS SHOWN BY TEETH

tion to this human machine; it was from them that the idea came that man's temperament resulted from the activity of his vital parts. For twenty-five hundred years the temperament of man has been described. Hippocrates writes of it as depending on the four primary components of the human body. He first observed the differences of bodily actions and functional activity which distinguished individuals, and thus the four temperaments founded on constitutional conditions were recognized and described by him. There has been no material change in the classification from the time of the ancients.

In a recent article from a London paper, reference was made to la-grippe in epidemic form. It was described as attacking man in four different ways, and these were none other than the physical conditions described in the four temperaments. In this we discover that the activity of the four parts exhibits itself in disease as in health.

An apt illustration of the outgrowth of temperament from a physical activity, is in the following:

By using only the physical properties of a

TEMPERAMENT AS SHOWN BY TEETH

piece of steel if it be bent while cold it will break, if it be heated to a red heat it can be bent or twisted, if heated and cooled quickly it will be tempered; thus the active physical properties give the temperament.

These exhibits of the inherent properties are but the natural physical attributes, and suggest the influences that affect their activity.

If the nervous system in one person or the muscular system in another shall dominate the individual, or if a higher functional activity be found in the heart and lungs of a third, and in the liver and organs of nutrition of the fourth, with these extreme differences of vital energy in each, can we expect to find the same stature, the same power of endurance, the same actions, and the same intellect?

Think of the wonderful construction of man with all the parts so correlated, depending on and assisting one another. Think also how nature has built man's bony framework, and placed within the wonderful and powerful machinery, the internal organs, and clothed all in a coat with the muscle striations so interlaced as to be capable of using the power generated within, and a part of this as above all

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else, the cranium, which is the judgment seat for the intelligent direction of this wonderful unit of life. For indeed it is a unit — the harmony of every part working in such a unison that we do not think seriously enough, perhaps, of any single part.

But it is the perfection of each single part that makes a perfect being in which is beauty of form as well as physical working. Each muscle lies nestled away and interlaced with its associate, so that their combined action may effect a movement of graceful lines and yet not sacrifice its motive power. Every artery graduating down to the size of a hair yet maintains an equal total blood pressure throughout its length, a condition absolutely foreign to all physics, and yet true, because of the rhythmical pressure from each one-thousandth part of an inch of the vessel wall.

It is nature's purpose to build all things to have an eternal fitness to its demands and uses. The teeth must respond to the demands made upon them. Nature is always consistent; it has things in keeping with its surroundings, so the teeth, like the face, must portray the temperament of the man.

TEMPERAMENT AS SHOWN BY TEETH

That teeth *do* portray the temperament by their color, shape, and size, also position in the jaw, is evidenced by the incongruity of expression sometimes caused by distorted dental conditions.

The various colors and shapes of the teeth make it necessary that they be correlated to the rest of the body. The tints are as variable as the tints of the skin. The pigment or color bodies of the animal life are present when life begins, and lends equally to all parts requiring color; hence in a balanced countenance, the affinity of color of the hair, eyes, skin, and teeth.

Not alone for esthetic, but for practical reasons, do the lines and planes of the teeth correspond to the general anatomy. The breadth of the six front teeth establishes the width of the mouth, while the grinding surface must correspond to the power applied according as the jaw is weak or strong.

Upon the rear teeth the pressure varies in different individuals from 75 to 200 pounds.

A weak, strong, or a dainty face, a male or a female, a young or an old person, a light or a ponderous frame, each lays rightful claim to

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teeth befitting their type. Should the tooth of the Nervous character, which is long and keen, of pearl blue or gray, be placed instead of the delicately ovaled cream-yellow tooth of the Sanguinary type, the eye would be instinctively offended.

There are four definite colors and four shapes in the teeth to represent the temperaments, viz.:

Sanguineous.	Nervous.	Bilious.	Lymphatic.
Cream yellow.	Pearl blue or gray.	Bronze yellow.	Opaque muddy.
Size, medium,	Length predominating,	Large angular,	Breadth predominating,
Ovalled.	Thin.	Long.	Short.

These are the distinct types, and while more often there is a blending of some two into a tooth harmonious to the individual — still the perfect specimens are frequently seen.

It is the harmony of the whole face in the color, shape, and size of the teeth as they correspond to the rest of the character that pleases us. It matters not whether we understand this subject or not, we are instinctively displeased by some incongruity in a face where there is a disturbance of nature's laws of harmony. Indeed, some poorly selected set of artificial teeth, or some displaced natural teeth, may upset all the harmony in a once beautiful or strong face.

TEMPERAMENT AS SHOWN BY TEETH

Nature is ever consistent, it never does anything by halves; harmony and constancy are its watchwords. Do not the wonderful color schemes of the plant life bear this out? Who has not seen the mackerel sky, with its rhythmical layer of clouds terraced one beyond the other, and the whole a harmony of steel blue and gray? Could you fancy fleecy clouds tipped with a golden hue when the storm is at its height, or do the rapid moving impenetrable black clouds portray the storm?

We have but to delve in nature a bit to find a constancy in all things. The first truth that was discovered in chemistry was proven so many times that not the slightest variation has ever been made to this first law. This was Avagadro's law, and stated that a given quantity of gas at a certain temperature always gave the same weight. But note this constancy of weight only remains as long as the temperature is the same. May we not infer how ready is nature to change and adjust all things to be in keeping with its surroundings and the demands made upon it?

The law of correlation running through all nature attracts and enchants us in the infinite

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diversity of its manifestations. In man this law of correspondence is so apparent throughout the organism as to establish a harmony between the teeth and his physical characteristics by which we are able to infer their color, shape, and size.

The definition of phrenology is character-reading from cranial conformations. This implies that character or temperament may be read from the skull convolutions. If nature shall mark one face that makes you instinctively think of brute force, and another that of tenderness and kindness, can you imagine it will get the teeth for one in the head of the other?

The teeth are a part of the face, and the harmony of the whole indicates the temperament of the individual.

These wonderful enameled sentinels of the mouth, that grind and shred our food, set firm in anger and chatter in fear, that sparkle in mirth and articulate our speech, are our sorrow or our joy as we care for or neglect them, would it not be strange if these human pearls were out of all conformity to the needs and demands made upon them?

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Whatever be our religion, we must glorify the source of so wonderful and complex an organism, with all parts in such harmony that they conform in color, shape, size and usefulness to the whole unit, whose integral parts live for one another.

FIRST TEETH — PRENATAL INFLUENCE

If one entering the condition of pregnancy would adopt the theme of a subsequent chapter, that of maintaining the highest degree of physical efficiency, then the most has been done for the health of parent and child and for the good of their teeth.

The reproduction of its kind by the organism is but a natural process; it is but a magnified physiological condition where one human cell gives birth to another and enough in such rhythmical succession to form the tissues of another being.

Until birth the child is a parasite, as it lives upon the blood of the parent. It receives its sustenance from the maternal blood much in the same manner as fish absorb oxygen from the water in which they dwell. The mother's heart must work harder and the organs of elimination do greater duty for the increased waste products; in short, it is a demand where

FIRST TEETH — PRENATAL INFLUENCE

one unit must supply sustenance for the life and growth of two.

Because one finds herself fertile, it is assumed she is endowed with the life-giving properties to become a mother. Though nature does not ask her to exercise any will or intelligence in this interesting phenomena, it probably does suggest by warnings of morning sickness, etc., the need of a high physical efficiency, that the period of gestation may be without embarrassment from the lack of strength or nutrition.

While a child is born into the external world at the end of the period of gestation, still it may be said birth of that life began nine months earlier.

This, but a technical way of expressing it, serves to illustrate the constant multiplication of the cell life; a first cell dividing into two, the two into four, and so on through the period till a new life is born. The growth so gradual and continuous portrays the thought that there must be kept up without intermission a physical and mental equilibrium to support the constant development of the cell life.

Is it not probable that the untoward symp-

FIRST TEETH — PRENATAL INFLUENCE

toms occasionally met are but nature's warning cry of some need; that the perverted or capricious appetite or some reflex nerve condition is but the sign of malnutrition or need of some physical action?

So remarkable is this phenomena, whereby nature appropriates from the mother the phosphates, lime-salts, etc., and holds them in readiness for the growing fetus, that one must at least acknowledge the need of the highest efficiency to support this period. Of the complex compounds found in the human tissue, nature has a way of finding them through the metabolism (perforce, by way of a balanced diet and normal living).

All this suggests the need of a conservation of energy, the eating of nutritious foods, supplying the demand for more pure air and oxygen, and an abstinence from excesses. It may be said that excesses and excitement have most to do with disturbing the normal metabolism, upsetting a nicely balanced physiological state.

Were there such a thing as suspended growth of the fetus or child, might it not be argued the child would be that much late being born?

FIRST TEETH — PRENATAL INFLUENCE

This is never so. If growth is continuous with the child and during a sudden illness of the mother the metabolism was weak, is it not pertinent to ask what part of the child was being formed at that time? While the cells of the vascular or muscular tissue have the power to degenerate and be replaced with healthy ones, this is not true of the cells of the teeth or of the bone.

The pitted and incorrectly formed enamel of the baby teeth so often found is attributable to the lack of power to assemble and deposit the enamel cells at the time the enamel was forming. Rickets is a disease of children where the bones contain too little calcium. The remedy would seem to be the supply of calcium itself, but this is not true, as the bones already formed appear to have no further power of absorption. True, they have yet to grow larger, which seems to permit the correction, but the enamel of the teeth once formed has no further growth, and any pits occasioned by faulty nutrition or suspended animation have come to stay.

That which wastes the strength is to be avoided. The diverting of this strength to the

FIRST TEETH — PRENATAL INFLUENCE

growing fetus takes from the mother's teeth their resistance to decay, and to avoid this ravage her teeth must be cared for early in the period. Any other treatment to be undertaken should begin at the beginning, that the expectant mother may be in full health and vigor and the offspring of her kind.

Much may be said, but all points to the one thought of aiding nature in a normal process. Hygiene suggests the warm bath and fresh air, both of which are agents that aid the avenues that discharge waste products. The early intelligent care of the physician means much to the health of both mother and child.

GROWTH VERSUS DECAY

Perhaps in no age before this has there been such a broadening of the intelligence, the search for truth and its application. Governments and philanthropists offer prizes for knowledge which is daily thrust upon us, pointing to the possibilities of the morrow. In each new discovery we note how constant are the laws of nature, and from this knowledge we are made to understand past failures and are better able to direct our efforts to an ultimate good.

Foremost in the truth to which this refers are the laws that govern the growth of man from the crude to the perfect state. This ideal state is man sound and strong in body and mind, with faculties alert to the laws that make for good, and recognizing, but avoiding, those that injure. Our efforts to maintain the perfect man are only in proportion to our understanding of the laws that govern him.

As we cease to develop the mental or physical man, we become the prey of a stronger one.

GROWTH VERSUS DECAY

In the history of progress we have seen the weak succumbing to the strong; animals, races, and empires have proven this.

Were there no perfect state all would be chaos; the strife for supremacy — the conquest for life — would cease, and we would drift without aim.

Indeed, the struggle of life is the rearing of man to the perfect state, to his ideal and true form.

There is a thought hard to define that is expressed in these words, *perfect; true form; without decay*; they define that which is contrary to degeneration.

Degeneration, and the laws by which we may oppose it, represents the strife of the world; it is the pitting of growth against decay.

The success at maintaining a normal condition is in proportion to the respect shown nature's laws. If man neglects to build and keep a true and perfect form, degeneration, which is ever lurking about, begins, and until you have eliminated that error the system is being overtaxed.

Nature marks the time when decay shall start: it is as soon as man is out of harmony

GROWTH VERSUS DECAY

with, or fails to recognize, the laws that build; at that instant decay begins and the cell life of the body is being attacked.

Man's natural enemy is disease; and just as he permits it, he is his own enemy. In health he is defended against an invading foe, and in proportion to his health his defense is strong.

If man, therefore, shall become alarmed and the query arises, "How shall he benefit from a knowledge of the lurking danger in evolution, or how shall he meet the changing conditions?" we must answer: By a conservation of those best energies in man which evidence his growth from the crude and primitive to the strong and perfect; that evolution synonymous with progress and development which shall prompt man to exercise his intelligence that he may rear the greatest number of individuals in their full health and vigor, with all their faculties and functions perfect, and in harmony with the conditions to which they are subject.

Then let it be man's aim to fortify himself, also to know the danger that lurks in an ignorance of nature's laws; may he be a fortification unto himself, WITH STALWART TEETH as sentinels guarding his citadel of strength.

GROWTH VERSUS DECAY

From the picture of that one who desires the betterment of health conditions for himself and fellow-men, we turn to the one whose surroundings and personal care of himself and family are all but a menace to society.

For this latter class, international congresses, state and city societies, meet to consider health-producing conditions. City health departments, public school inspection bureaus, mother's clubs, and many others, are all wedges driven to the same end, namely the prevention of disease.

To this end movements are afoot combating certain infectious diseases with the result that institutes for tuberculosis are springing up in the populous centers, receiving state and federal aid.

With the mouth as described (page 52), we can understand how the saliva may linger in the conditions there until it is absolutely virulent. The transmission of disease to others is to be avoided and since the saliva is so endowed, the first instruction given patients at these institutes is to burn the sputum to avoid spreading their malady.

If the mouths of some are seething hotbeds

GROWTH VERSUS DECAY

or incubators of infection, the great gaping cavities alive with germs of tuberculosis, etc., the question would seem, how much would it help the general good if a million people so affected, who expectorate in public places, had their mouths sterile and clean?

Does it not seem that of the millions of teeth decayed beyond repair, and the ulcerated roots laden with germs **WAITING A SUITABLE TIME TO INVADE THE SYSTEM**, that these might be extracted to the benefit of the individual, if not to the public?

To this end it does not seem too radical to say the mistress might investigate the mouth of the maid, the parent that of the children, and the state that of the elders.

When the teeth are not a menace to the health of the individual or public, when they are sterile and clean, then and not until then will they be "Human Pearls."

PERSONAL RELATION OF PATIENT AND DENTIST

The execution by the Dentist of his high ideals demand much of him. He must be a surgeon, doctor, histologist, chemist, metallurgist, machinist, artist, and sculptor.

Because he cares for the nervous, hysterical, fearful, and despairing one, or the crying, impetuous, discouraged, and unbelieving one, he must have patience, judgment, fortitude, and strength.

It was hoped these pages might bring the patient and dentist into a closer, more intelligent, sympathetic, and helpful relation and by so doing benefit the patient, elevate the profession, and assist the operator.

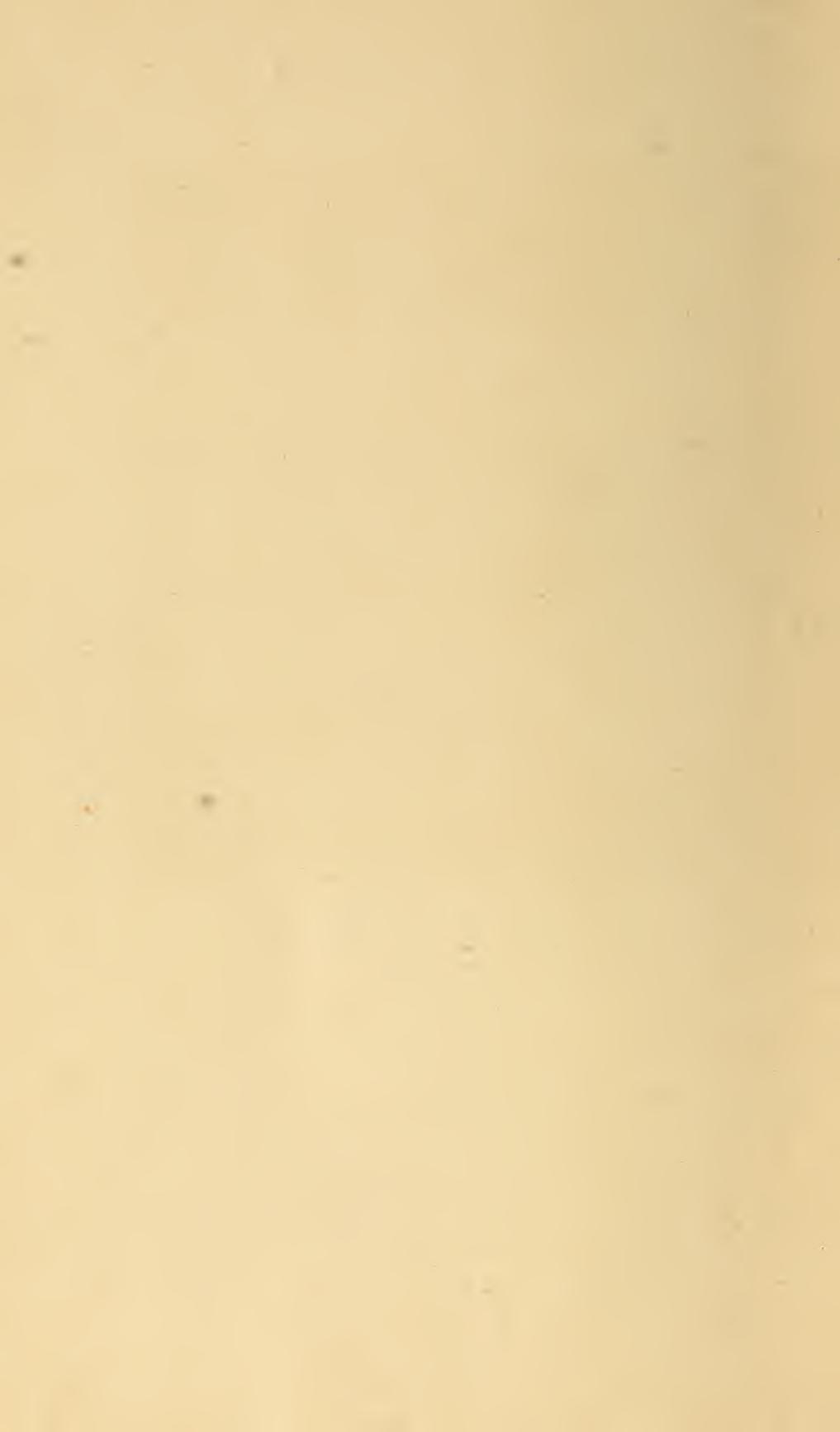
The average patient of to-day is a barrier to the further advancement of Dentistry as a science. Without knowledge on a subject he cannot enthuse over it, even be interested in it; but knowing some of the simple every-day truths as contained herein, he will aid and abet

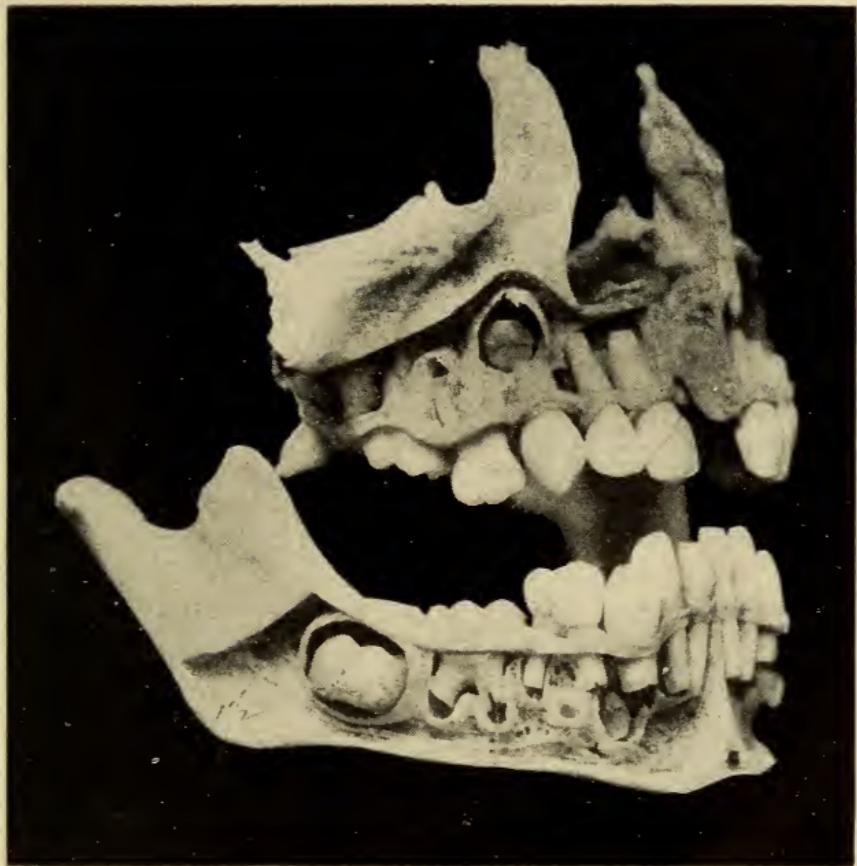
PATIENT AND DENTIST

by his sympathy and encouragement those higher attainments that have made Dentistry a true science.

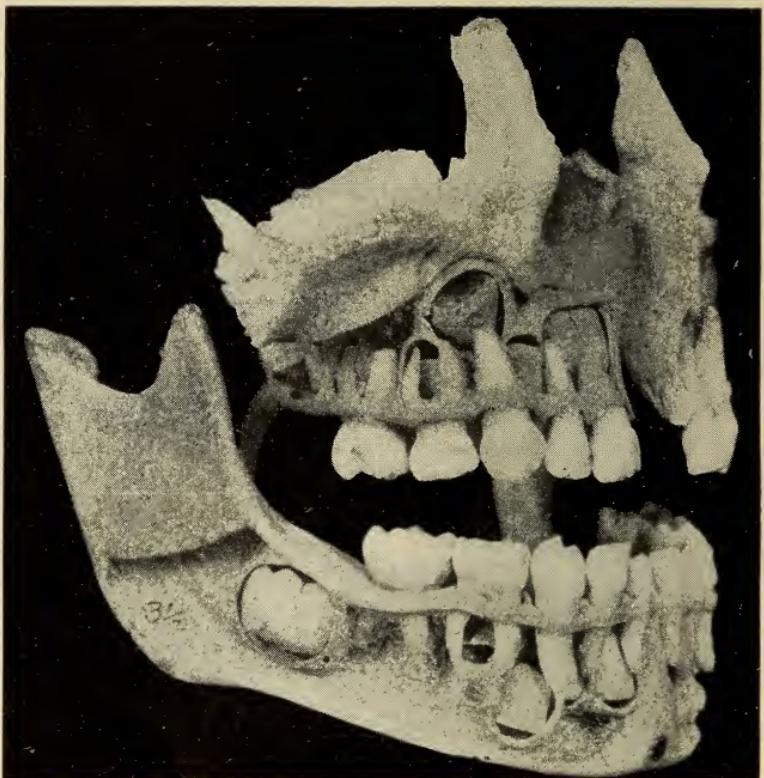
The archer does not aim further than the arrow will carry, and the dentist can only aim in each operation as far as he is allowed to execute.

Remember, there are gradations in both skill and value of materials used, and that in a faithful operation time has a value commensurate with the skill, and if these conditions are valued too cheaply, or there is exercised too extreme economy, the service rendered might reasonably be "a tooth for a tooth."

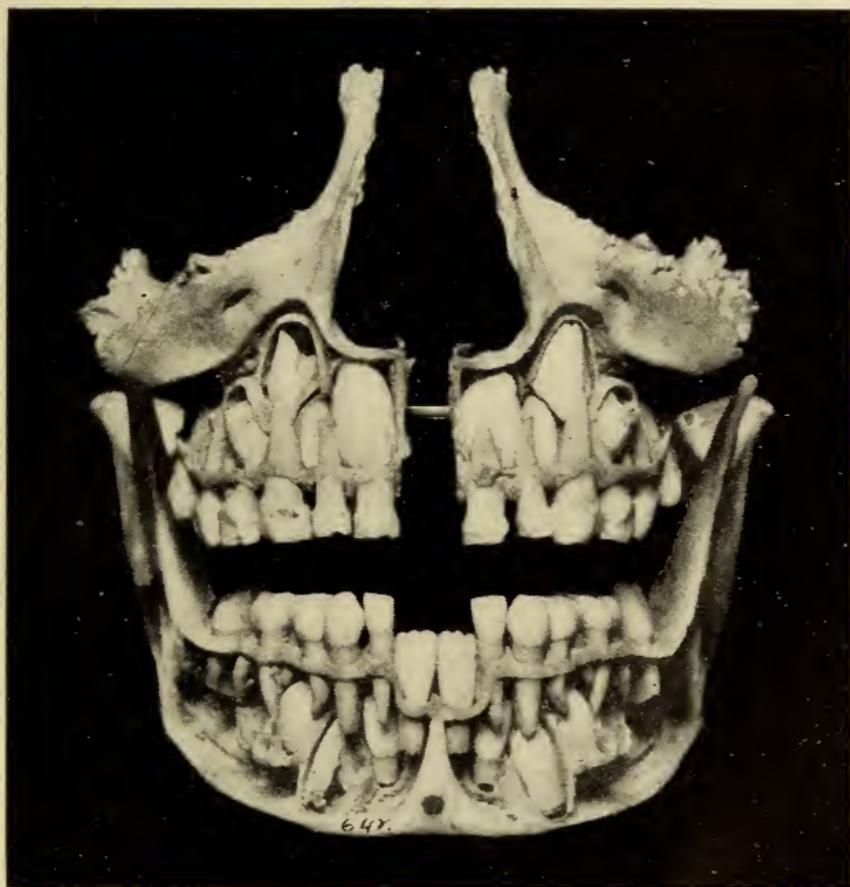




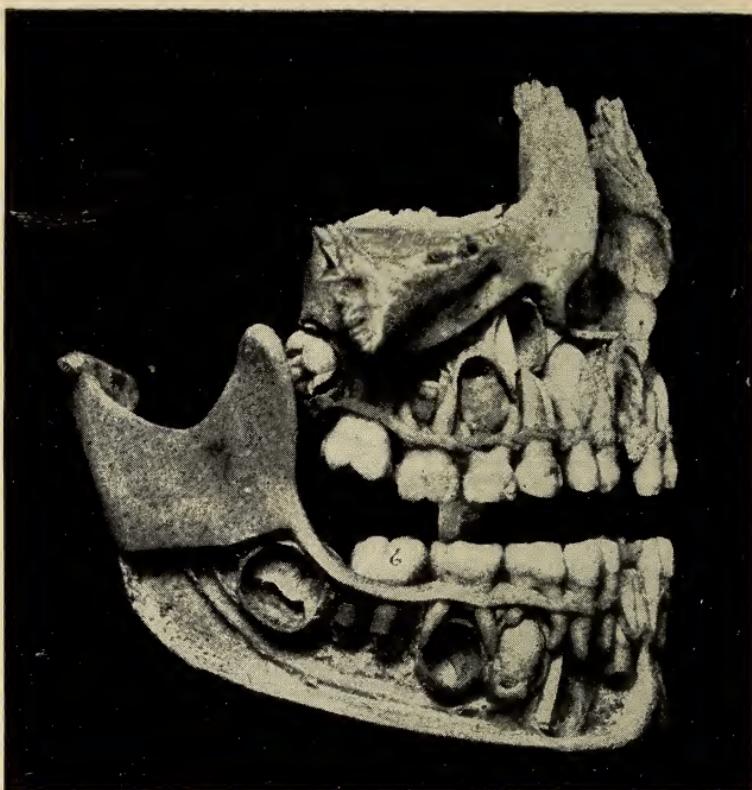
1½ years: In this and subsequent pictures, the external surface of the jawbone has been removed to show the roots and developing teeth. Note the two baby molars, neither of which have their roots completed. The tooth at the left, with no roots as yet, is the enamel shell of the first permanent molar which is to erupt 4½ years later.



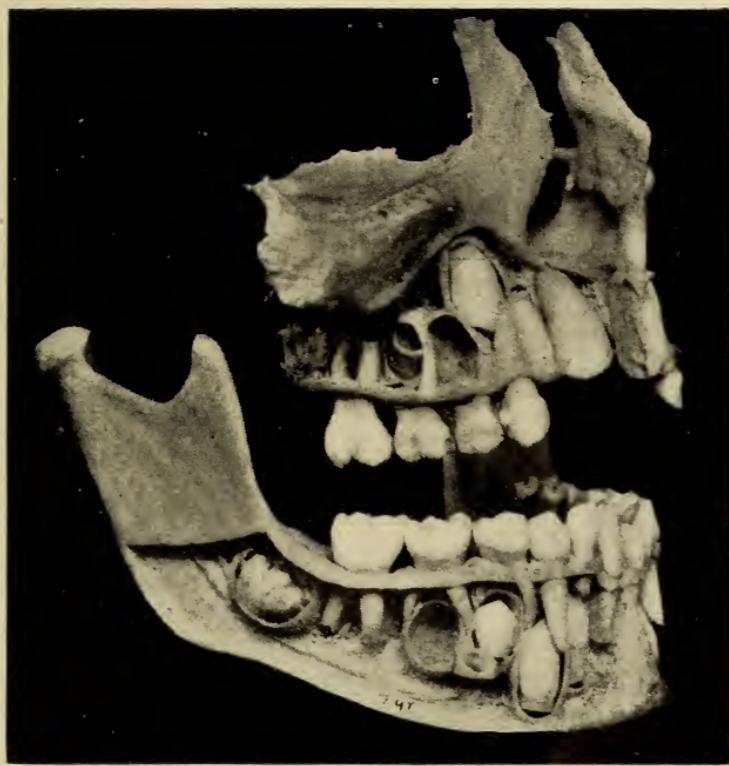
3½ years: The baby molars have their roots nearly completed. Note the beginning of permanent teeth at the roots of baby teeth.



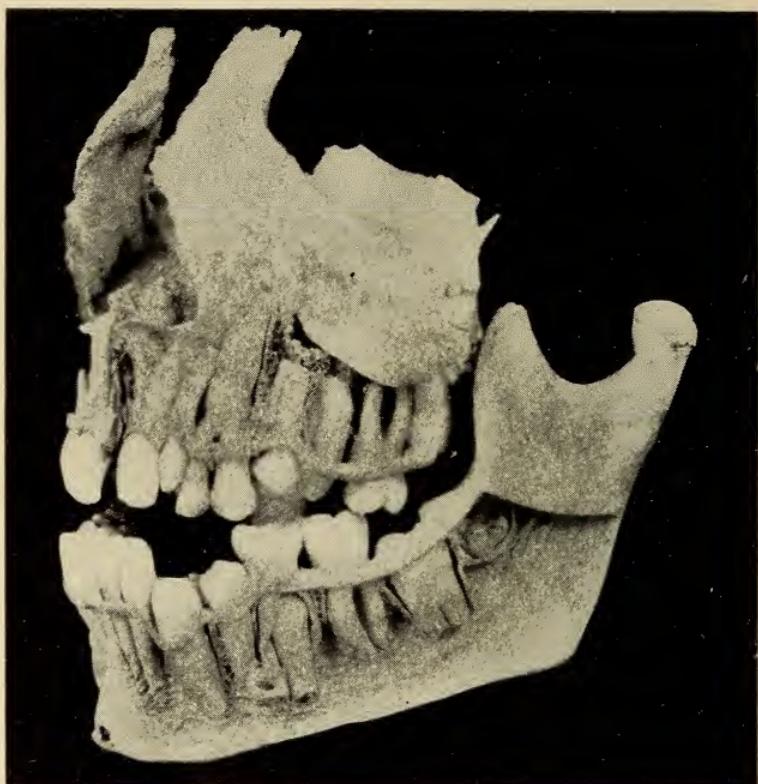
6th year: Note the mouth is full of permanent teeth, soon to crowd out their predecessors. The two lower centrals have already done so. This picture suggests the need of the normal growth and development of the mouth, that the teeth may erupt in their proper places.



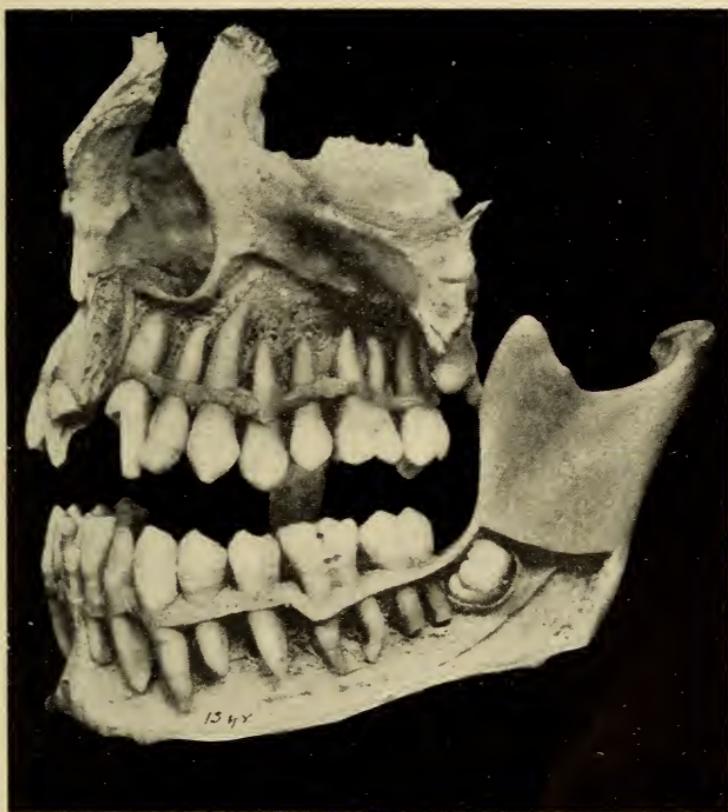
6½ years: Note the capsule under a baby molar, from which a developing tooth has been removed to show its position between the roots of a temporary tooth. In capsule at the left, is but the enamel shell of the 12-year molar which is to erupt 5½ years later.



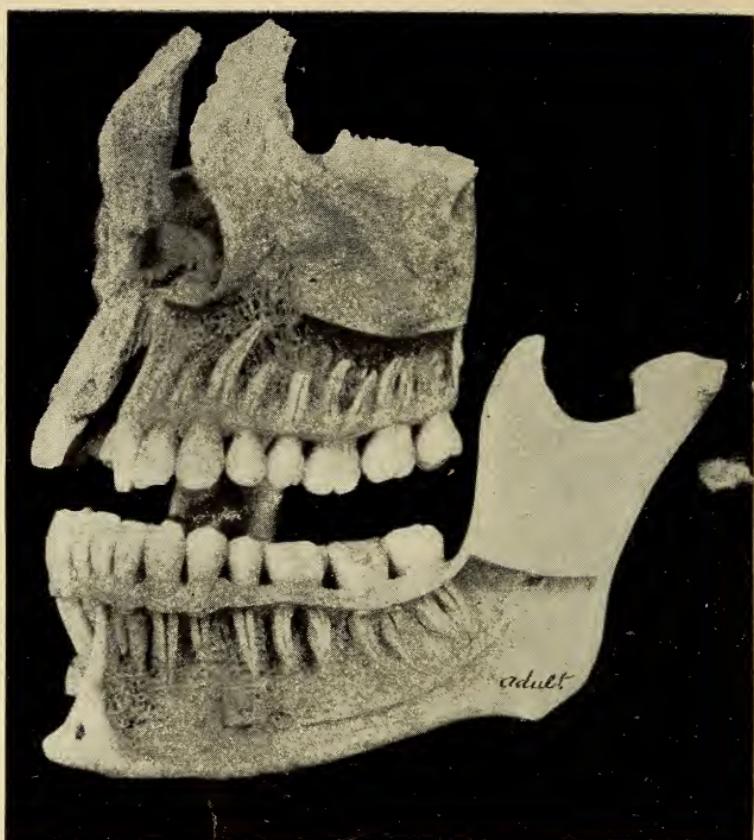
7th year: Note the developing permanent "eye" teeth above and below. They are to occupy the corner of the mouth; if no corner develops they must protrude as "tusks."



11th year: In the lower jaw only one baby tooth remains. Note the undeveloped roots on the 12-year molar at the right, and the developing enamel of the wisdom tooth behind it.



13th year: The nearly developed mouth. The roots are not quite completed on 2d molar, and the wisdom tooth has no roots at all.



Adult mouth: See the porous bone above and below. The nerve canals in the roots are made visible by carving away part of the roots.

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